

# **Diversion Effects on Fisheries Technical Team** **August 12, 1998, 1:00 p.m. to 5:00 p.m.**

## **Meeting Minutes**

**Present:**

Michael Thabault  
 Gary Stern  
 Karl Halupka  
 Dale Sweetnam  
 Curtis Creel  
 Mike Ford  
 George Barnes

Tara Smith  
 Paul Fujitani  
 Pete Rhoads  
 Elise Holland  
 Joe Miyamoto  
 Gary Bardini  
 Sarah Cotter

Paul Marshall  
 Mark Cowin  
 Mark Holderman  
 Sanjaya Seneviratu  
 Dick Daniels  
 Dave Fullerton

## **Particle Tracking Model (PTM)**

Tara Smith and Sanjaya Seneviratu of the Department of Water Resources addressed seven questions posed by Bruce Herbold regarding the Delta Particle Tracking Model. A handout outlining each question and answer was provided, and is summarized below.

**Q1 (a).** What is the effect of a Hood Diversion on Central Delta water quality?

**A1 (a).** Water quality data from Alternatives 1C and 2B were compared at various Delta locations. Alternative 2B showed considerable water quality improvements from July through January or February at 3 of the 4 locations.

**Q1 (b).** How much water is required to offset extended Delta Cross Channel closure in the fall?

**A1 (b).** Alternative 2B was run with extended closure of the Delta Cross Channel, only opening it in July and August. The modeling results were provided.

**Q2.** What is the minimum average flow downstream of Hood to prevent reverse flow?

**A2.** Two tables of flow data for Alternative 2B were provided, one showing monthly Sacramento River flow and the other showing the minimum required flow downstream of Hood to prevent reverse flows. The shaded area on the first table indicates that reverse flows resulted at least 3 times under this configuration. The implication of this suggests that 75% of the time fish migrating downstream of Hood will encounter fish screens on at least 3 different occasions under Alternative 2B assumptions.

A relationship between Sacramento flow and percentage of time that reverse flow occurs was also shown comparing Alternatives 2B (for 5 and 10 K cfs pumping at Hood) and 1C.

**Q3.** What is the fate of particles entering Sacramento for different hydrologies and at high and low export rates?

**A3.** Alternatives 1A and 1C show little difference in results for a Freeport injection; however, Alternative 2B is much less because the Delta Cross Channel is closed under this configuration resulting in much lower Delta exports.

The fate of particles injected at 4 other locations for Alternatives 1A, 1C, and 2B were also shown for high and low export rates. These results suggest that ISDP does not have an impact on the fate of particles injected at the 4 locations.

**Q4.** What levels and durations of export reduction are necessary to alter the fates of a substantial increment of entrained eggs and larvae?

**A4.** The substantial increment needs to be defined to answer this question. B.J.'s report entitled "Analysis of Transport in the Sacramento San Joaquin Delta" is a good reference to help address this.

**Q5.** How do net flows relate to fates of particles, particularly what are the affects of a Hood diversion under Alternative 2 and broader Delta channels?

**A5.** There are situations that indicate Alternative 2 may create a 'river of water' that particles do not traverse, primarily with low inflows and high export hydrologies.

Modeling of broader Delta channels, i.e. setback levees, was conducted with additional changes to the system, including increased flows into the Mokelumne which would also affect the channel velocities.

**Q6.** What does particle tracking suggest as the right time frame for real-time management of the system, particularly at Sacramento, Jersey Point, and Turner Cut?

**A6.** The answer to this question depends on the hydrology and geometry of the system, as well as the location of the particles. A table of data providing information on the percentage of particles lost to exports after 10, 20, 30, and 60 days at various locations and export-inflow combinations was provided in the handout.

**Q7.** What data could be gathered in 7 to 10 years to resolve the discrepancies between particle tracking results and biological data?

**A7.** On-going modeling improvements such as a better representation of channel bathymetry in the model could improve modeling flows, velocities, and stage results. Behavioral information could also be incorporated into the particle tracking model to improve the capability of PTM for tracking the movement of fish in the Delta.

#### **Discussion:**

Professor Bledsoe of UC Davis has studied the modeling of fish behavior and may have a behavioral model that could interface with the PTM model.

## **No Name Group Activities**

The No Name Group has been given the task of developing a set of tools to analyze various reoperation scenarios from a water supply perspective. George Barnes of the Department of Water Resources briefed the DEFT Team on the current activities of the No Name Group and distributed an August 11, 1998 draft report entitled, "Preliminary Assessment of Water Supply Benefits of New Facilities Under Alternative Scenarios of Environmental Obligations" for review.

The No Name Group encountered some difficulty with reprogramming the DWRSIM model to incorporate Madera Ranch Groundwater Bank as a CVP project. Progress was made on incorporating the other new facilities (ISDP, Intertie, Unlimited Joint Point) into the model. George estimated that the initial "No Name Studies" will be completed by the No Name Group meeting on August 14.

Results from these DWRSIM studies are intended to define a reasonable range within which additional Delta modeling studies will be conducted to develop further detail.

### **Discussion:**

Several DEFT members objected to the phrase "DEFT Team Recommendations" used in the No Name Report. This phrase refers to a series of reoperation studies *suggested* by Elise Holland for DEFT evaluation, and was not intended to imply any formal recommendation by the DEFT Team. These actions would be characterized more accurately as "Elise Holland's Recommendations", and a change will be made in the report.

There is general concern that the No Name Group and the DEFT Team should more closely coordinate their activities to stay focused and maintain balance between the objectives of both groups. Pete Rhoads suggested that representatives from each group brief the Policy Group to alert members on some of the discrepancies or conflicts that may have arisen between the No Name and DEFT groups and to identify the range of issues that each group will address. DEFT and No Name should also explicitly point out to the Policy Group that tools such as Joint Point operations, though difficult to quantify, could provide additional flexibility in the system when it comes to "real-time" decision making.

Elise Holland emphasized the importance of presenting the whole range of findings from the DEFT Team. It is not the responsibility of the No Name Group or the DEFT Team to decide on where the activities of these groups intersect. It is the responsibility of the Policy Group to develop a working plan based on the findings of both groups.

Curtis Creel suggested that DEFT determine a limitation or range under which "real-time" decision-makers must operate, i.e. establish a set number of days that pumping can be reduced during the year for fishery benefit. A limited number of reduced pumping days would encourage the optimization of operations for environmental benefit. Elise Holland warned that predefining a range would be difficult for such a dynamic system and might

lead to forcing a trade-off of benefits for one species at a sensitive time over another. This would be unacceptable to the fishery agencies.

**Future Action:**

Curtis Creel was appointed to coordinate a proposal that will identify issues associated with the accounting of ecological water storage in the system. The proposal will be discussed at the next DEFT meeting.

**CALFED Operations Modeling**

Gary Bardini of CALFED provided preliminary results from 6 studies that incorporated combinations of the actions Elise Holland suggested in a prior DEFT meeting. Study results indicated each of the new actions would reduce, to varying degrees, the long term and critical period deliveries south of the Delta when compared to the base case Study 1004.

Gary also provided a series of monthly exceedence graphs comparing computed Export-Inflow Ratios for each of the six studies. Results indicate that by imposing additional constraints on the E/I ratio during Dry and Critical years, the E/I ratio governs the majority of the time.

**Discussion:**

Gary emphasized these are only preliminary results and that it is important to recognize the limitations of modeling. "Available water" is always subject to change, and it is difficult to adjust for Shasta and the Delta Cross Channel, or salinity flow relationships in the model.

**Future Action:**

Gary would like to provide an evaluation of CALFED storage at different levels of demand and suggested DEFT actions for the next DEFT meeting. Additional evaluation of DEFT actions on Delta operations and project deliveries will also be provided.

**Analysis of Phase 1 Delta Habitat Plan**

Pete Rhoads presented a draft report entitled "Analysis of Phase I Delta Habitat" and an accompanying Delta map to identified key restoration projects and locations for Stage 1 implementation.

**Discussion:**

Several DEFT members expressed concern over item #6, which would create a *large* habitat restoration pilot project in an undetermined location. "Large" does not provide

sufficient description of the project. The scale of pilot projects is critical and must be large enough to show measurable effects.

South of Delta ecological improvements are questionable if nothing is done about exports which may offset any potential benefits.

#### **Future Action:**

Pete Rhoads urged all DEFT members to review the draft Phase 1 Delta Habitat plan and provide comments.

### **Ecosystem Restoration Program (ERP)**

Dick Daniels updated the DEFT Team on some of the recent activities of the ERP.

- The costs associated with setback levees may be prohibitive and additional studies must be conducted to identify all the issues and weigh costs to benefits. The Corps of Engineers is currently conducting an independent study on setback levees. The ERP workgroup has determined areas along the upper middle Sacramento River and lower Feather River as areas of restoration. There are some levees in this area that experience frequent seepage which floods adjacent farmlands. Since maintenance of levees is a local consideration, affected farmers have expressed a willingness to support construction of more dependable setback levees. A 122-mile stretch along the Sacramento River of setback levees could cost up to \$5 million per mile, so less expensive alternatives have been considered. One alternative calls for creating shallow water habitat for fish by encouraging the growth of new riparian vegetation in areas that are naturally inundated during critical seasons.
- ERP assumes that all water for instream ecosystem management will be acquired through the water market from existing or new supplies and not through new regulatory authority. It is estimated that approximately 100 TAF of water can be acquired through transfer and conservation programs; however it is not likely that ERP flows will be significant unless new storage is constructed.
- Restoration of the Yolo Bypass is a priority and includes grading and increasing flows in this area for the benefit of fish species such as the splittail. A 30-day test study has been proposed in mid-February through mid-March to mimic the natural hydrograph in the Bypass.
- The ERP workgroup has developed a draft report of prioritized actions for Stage 1 implementation. Contact Dick Daniels for a copy.

### **Harvest Management**

Joe Miyamoto of East Bay Municipal Utilities District presented the DEFT team with a draft agenda for the DEFT Harvest Management Subcommittee meetings. Several NMFS biologists have been asked to attend the meetings, which are tentatively set for August 17, 20, and 21. The intent of these meetings is to determine the objectives and goals of a harvest management program. The following agenda topics will be discussed:

- Current methodology for computing ocean harvest rates
- Review of recent ocean and recreational harvest rates
- Species recovery goals
- Contribution of harvest management to species recovery goals
- Links to habitat
- Hatchery management related issues
- Potential actions to assist with recovery of salmon stocks

### **Striped Bass Stocking Program**

Gary Stern of the NMFS updated the DEFT team on some of the recent activities of the Striped Bass Stocking Program. The Program is a joint effort between NMFS, FWS, and CFG and some of the current issues are as follows:

- Part of the Stocking Program involves tagging and recapturing striped bass to track the survival success of this species. Gill and Fyke nets are capture techniques that are currently used in this program; however, they have been found to unintentionally kill salmon that are also captured in the nets. Alternative techniques are being considered, including hook and line capture, to prevent unnecessary mortalities of other sensitive fish species during this study.
- One method that can be used to reduce predation rates of striped bass on salmon is to stock older salmon that are less vulnerable to predation. Another method is to enhance both species at the same time to encourage a natural balance in the population of both species.
- The consumption rates of salmon by striped bass used in CFG's model are questionable.
- Gary will provide a summary table outlining these issues.

### **CALFED Water Quality Program**

Paul Marshall from the CALFED Water Quality program provided a draft list of prioritized water quality actions to be implemented in the first 7 years.